

REMARKS

In view of the above amendments and following remarks, reconsideration of the rejections contained in the Office Action of July 10, 2006 is respectfully requested.

In the Office Action, claims 40, 41 and 44-48 were rejected by the Examiner as being unpatentable over Lebel et al., U.S. 6,334,807 in view of Watanabe et al., U.S. 5,951,368 and Osterheld, U.S. 6,616,513. Further, claims 40 and 41 were rejected by the Examiner as being unpatentable over Schultz, RE 34,425 in view of Watanabe et al., U.S. 5,951,368. Further, claims 40 and 41 were rejected by the Examiner as being unpatentable over Lenkersdorfer, U.S. 6,213,844 in view of Watanabe et al., U.S. 5,951,368 and Osterheld, U.S. 6,616,513.

However, by the above amendments, claims 40, 41 and 48 have been canceled. Such cancellation should not be taken as any acquiescence to the positions taken by the Examiner.

Claim 44 has now been amended to recite that the attitude control mechanism is operable to calculate a force applied to the substrate carrier based on the rotational moment and the direction of frictional force acting on the substrate carrier and a contact area where the substrate contacts the polishing surface. New independent claims 49 and 50 also recite this limitation.

This limitation to the claims is supported by paragraphs 73-81 of the specification. As discussed in the specification, the attitude control mechanism prevents the substrate carrier from being inclined. Consequently, a uniform pressure can be applied across the entire surface of the substrate on the polishing surface, even when the substrate carrier is positioned in the overhanging condition in the polishing position.

In the polishing position, the substrate carrier is positioned so that a portion of the lower surface extends radially outwardly of the outer peripheral portion of the polishing table, i.e. in the overhanging condition. When the entire surface of the substrate contacts the polishing surface, the substrate is not likely to tilt relative to the polishing surface, and thus control is relatively easy. However, when the substrate is polished, as in accordance with the present invention, while overhanging the peripheral portion, the substrate is likely to tilt relative to the polishing surface.

Accordingly, the attitude control mechanism calculates a force that is applied to the substrate carrier based upon the rotational moment and the direction of frictional force that is acting on the

substrate carrier and the contact area where the substrate contacts the polishing surface. During a polishing operation, when the turntable is rotated at a predetermined speed, and the substrate carrier is urged against the polishing surface while positioned in the overhanging position, the substrate carrier is subject to the rotational moment caused by the frictional force generated between the substrate and the polishing surface, and the substrate tends to be inclined. Accordingly, in order that the attitude controller can control the force applied to the substrate carrier to cancel the rotational moment so that the entire surface of the substrate that is being polished is brought into contact with the surface at the same time, the attitude control mechanism calculates the forces applied to the substrate carrier based on the direction of the frictional force and the rotational moment acting on the substrate carrier, taking into consideration the contact area where the substrate contacts the polishing surface to cancel the rotational moment. These features are not disclosed or suggested by any of the references cited by the Examiner.

While Lenkersdorfer and Schultz disclose overhanging a substrate, this is simply done for the purpose of end point detection or film thickness measurements.

Watanabe discloses an attitude controller, but is not concerned with the overhanging condition. As such, it can be seen that there is not disclosed an attitude control mechanism operable to calculate the force applied to the substrate carrier based on the rotational moment and the direction of frictional force acting on the substrate carrier and the contact area where the substrate contacts the polishing surface.

The cited patent to Lebel also appears to be directed towards end point detection, and not toward the objects of the present invention, and, in particular, does not appear to address an attitude control mechanism. Osterheld also clearly does not relate to the present invention as now claimed.

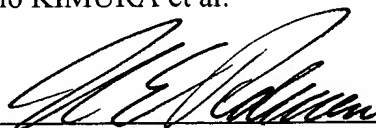
Accordingly, it may be seen that all of the claims that now pend in the present application clearly patentably distinguish over all of the references cited by the Examiner. Indication of such is respectfully requested.

In view of the above amendments and remarks, it is submitted that the present application is now in condition for allowance, and the Examiner is requested to pass the case to issue. If the

Examiner should have any comments or suggestions to help speed the prosecution of this application, the Examiner is requested to contact Applicants' undersigned representative.

Respectfully submitted,

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